A Great Astronomical Meeting

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THE month of September, 1923, was an important one for astronomy in Western America, as it contained two unusual astronomical events, both happening in the State of California. A total eclipse of the sun occurred on September 10 and a combined meeting of the American Astronomical Society, of the Astronomical Society of the Pacific, and of Section D of the American Association was held at the Mt. Wilson Observatory on September 17-19. Although the sky was unfortunately more or less completely clouded at most of the observing stations on September 10, the meeting was very successful and many important astronomical results were there announced. It is proposed in this article to say something about the eclipse and to give a short account, in as non-technical language as possible, of the principal advances in astronomy described at the meeting.

The eclipse of September 10, 1923, in which the shadow path passed over the southwestern corner of the State of California, and thence through Mexico, was more favorable than any occurring in America for many years, and very elaborate and complete preparations were made for observing it. The Yerkes, Washburn, Des Moines and Northfield Observatories had instruments and parties near Avalon, Catalina Island. Pomona College planned to observe the eclipse about ten miles south on the same island. The Mt. Wilson Observatory had installed a very complete equipment at Point Lorna, near San Diego, and many new experiments and observations were proposed to be tried there and at the observatory on Mt. Wilson, where the eclipse would be about 99 per cent total. At Point Lorna was situated also the apparatus of the McCormick Observatory, and several other observers were also located in the neighborhood. The Lick Observatory expedition, usually very successful in choice of sites, with some other parties were located at Ensenada, in Mexico, a few miles south of the border and a short distance inland.

Unfavorable Conditions

The chances of clear skies at all these stations as estimated from observations over several previous years were very favorable, about 90 per cent, and no one expected in sunny California anything but favorable weather. But at the time of totality the skies were almost completely cloudy all along the coast and no successful observations were made either on Catalina Island, near San Diego or at Ensenada. Only in the interior of Mexico, where the conditions were not considered so favorable, were any photographs obtained, and the Sproul and Steward observatories and the German expedition obtained some valuable results.

It was very unfortunate that the weather was cloudy, as preparations had been made for many new and important observations of the corona, the flash spectrum and the displacement of the light rays, and it will be many years before such a favorable opportunity again occurs. The time occupied and the expense involved in preparing for the observations was very considerable, and it was very disappointing and disheartening to the astronomers to have everything ready, all the apparatus adjusted and the programme carefully rehearsed for the three minutes or so of totality and then to start and dismantle the equipment after the moon had passed over the solar disc behind such thick clouds that no results could be obtained. The writer had made no particular preparations for observing, but had gone to Catalina to see the eclipse, and his principal feeling was one of deep sympathy for those who had given so much time in preparation without any return, and of regret for the loss to science of the proposed experiments and observations.

However, everyone took the disappointment philosophically, and as soon as their apparatus was dismantled and packed up, hastened to Pasadena to make up for their disappointment by taking full advantage of the opportunity the location of the shadow path offered of viewing the equipment and discussing the work of the Mt. Wilson Observatory. As the astronomical meeting did not begin for a week later than the eclipse, this gave a fine chance to see more of the work of the observatory than if the eclipse had been successful and everyone occupied with developing plates and discussing results. This formed a partial compensation for the failure and was fully taken advantage of by the writer and many of the visiting astronomers. The work of the Mt. Wilson Observatory is so varied and its equipment so complete and original as to make it a most valuable experience for astronomers.

Interesting Addresses

The astronomical meetings began on Monday, September 17, at the University of Southern California in Los Angeles. The Monday morning session, presided over by President W. W. Campbell, of the University of California, president of the American Astronomical Society, consisted principally of papers on meridian astronomy and celestial mechanics, which, though important in the progress of astronomy, hardly lend themselves to description in a popular article. The afternoon session, although given by the Astronomical Society, was of such timely and general interest that it was open to all the sections of the association and to the affiliated societies, and consisted of a symposium on eclipses and relativity, and a report of the eclipse expeditions. There were four addresses on eclipses and relativity, the first being by President Campbell on "Some Conditions Apparently Existing in the Solar Corona."

President Campbell is probably the most indefatigable eclipse observer in the world and has organized and attended ten expeditions, eight of which have been successful and only two cloudy. Consequently the Lick Observatory possesses the most complete and continuous series of photographs of the solar corona, all made with the same instrument under as nearly as possible similar conditions. Dr. Campbell traced the changes in the appearance and structure of the corona and correlated them with the sun spot period, illustrating this correlation by beautiful photographs of the corona. Nevertheless the constitution of the corona remains an unsolved problem, and it is much to be regretted that the observations of the present eclipse, which might have added considerably to our knowledge of this mysterious phenomenon, were prevented by clouds.

The second address of the symposium was given by Dr. R. J. Trumpler, assistant astronomer at the Lick Observatory, on "Relativity as Represented by the Einstein Eclipse Problem." Dr. Trumpler, who, under Dr. Campbell, had charge of the observations for the relativity bending of light at the Australian eclipse, gave an account of the observations and measurements made to determine the amount of this deflection. As is well known the Einstein theory predicted that the light from a star just grazing the edge of the sun would be bent inwards by a very small angle, 1.74 seconds of arc, while according to the Newtonian theory this bending should be only half this amount, 0.87 seconds. The bending of the light from neighboring stars will decrease proportionally with the distance from the centre of the sun. If, then, a photograph of a star field is made when the sun is in another part of the sky, and again when the eclipsed sun is in the field, the star images in the latter case will be spread outwards, away from the sun, by the amounts given above. This quantity, on the average only about half a second of arc for the stars in the Australian eclipse field, corresponds to a very small displacement of the images on the plates, less than one two-thousandth of an inch, and it is obvious that great care and skill is necessary to measure and calculate this displacement. Dr. Trumpler showed that the measures of Dr. Campbell and himself on the Australian plates agreed in giving a displacement of almost the exact amount predicted by Einstein, and that there was no possibility that the displacement could be the half required by the Newtonian theory. As the plates obtained by Dr. Chant and Dr. Young at the same eclipse and measured by Dr. Young, although not of so good quality as the Lick plates, also gave a similar deflection, and as the results obtained in the British expedition of 1919 were thus fully confirmed, there can be no doubt that, whatever the cause, the deflection of light caused by the gravitational pull of a heavy body like the sun is of the amount predicted by Einstein, and should thus be rightly considered a confirmation of the general theory of relativity. The anti-relativists, while admitting that the deflection is present, claim that it may be due to another cause or causes, but it seems to me that the confirmation of Einstein's third prediction announced by St. John at this meeting, and described below, pretty well takes the ground from under their feet and that they are leading a forlorn hope.

Sun's Atmosphere

The third paper of the symposium was given by Dr. S. A. Mitchell, director of the Leander McCormick Observatory, Virginia, and a Canadian by birth and education, on "How the Sun's Atmosphere is Studied at Eclipses and the Interpretation of the Results Through the Aid of Modern Physics." One of the most thoroughly studied of the phenomena observable at the time of a total eclipse of the sun has been what is commonly called the flash spectrum, and Dr. Mitchell has probably done more work on the flash spectrum than any other astronomer. As is fairly generally known, the solar spectrum is an absorption spectrum consisting of a bright band of the rainbow colors crossed by a great number of fine dark lines. The spectrum is produced by the glowing photosphere, the luminous disc of the sun, which gives the colored background, while the dark lines are due to the absorption of a surrounding atmosphere which, though highly luminous and consisting of the incandescent vapors of the various elements present in the sun, is less luminous than the photosphere. The light from the photosphere is absorbed only in the positions in which the various elements present in the surrounding atmosphere if vaporized in the laboratory would give bright lines. This obviously forms a means of identifying the elements present in the sun, but it must be remembered that normally these lines can only be seen in the solar spectrum as dark lines. When, however, the bright photosphere is just covered by the disc of the moon at the time of eclipse, the surrounding atmosphere, also luminous as above stated, has a chance to send its spectrum unaffected by the underlying photosphere, direct to the spectroscopes, and we then evidently get not dark lines of the normal solar spectrum, the bright lines replacing the dark lines of the normal solar spectrum. This luminous atmosphere of the sun only extends to a height of about 800 miles, and is evidently progressively covered by the disc of the moon as it advances across the sun. Successive spectra taken during the interval enable the elements present at different heights in the solar atmosphere to be determined. Dr. Mitchell, from flash spectra obtained at different eclipses, has tabulated very completely and carefully the heights to which the various elements rise, and in his paper analyzed the bearing of these levels on Saha's ionization theory which gives the only accepted explanation of the formation and constitution of stellar atmospheres. The importance of the work of Dr. Mitchell chiefly consists in its offering a hope, by its attack in detail upon the only star susceptible of such method, of explaining the nature of the great furnaces of the stars and the processes which govern their evolution through the various stages we see exemplified in the sky.

Einstein's Theory

The fourth paper of the symposium, "The Constitution of the Sun's Atmosphere, the Levels of the Gases and the Nature of Their Circulation," by Dr. C. E. St. John, of the Mt. Wilson Observatory, contained, in my opinion, the most important pronouncement of the meeting. The third astronomical prediction of Einstein, based on the general relativity theory, states that the spectrum lines given by a heavy body such as the sun are displaced to the red by about a hundredth of an Angstrom unit, an amount the same as would be produced by a velocity of about two-thirds of a kilometre per second away from us. Various attempts have been made from time to time to verify or otherwise this prediction, but with contradictory and uncertain results. Dr. St. John has been working on this enormously difficult and complex problem for some years, and has only now been able to reach a definite conclusion. The problem is difficult, because the displacement is very small and because other causes than the Einstein shift may readily produce it. Pressure in the solar atmosphere will cause shifts in the same direction, while a downward drift of the vapors on the region, observed at the speed of half a mile a second, relatively slow for the solar atmosphere, would produce the predicted displacement. Other causes, such as anomalous refraction or scattering, are quite capable of producing the required shifts, and though it is easily possible to measure the predicted displacement, the difficulty of the problem consists in disentangling the various causes and determining to which of these causes any observed displacement is due. Dr. St. John, after most exhaustive analysis and careful examination of all the effects, has reached the conclusion that the displacement of the lines of the solar spectrum predicted by Einstein is certainly present. He finds in addition that the upper levels of the solar atmosphere are moving downwards with a velocity of about three-tenths of a kilometre, gradually decreasing to zero at a middle level, while in the lower levels there are upward movements of about the same speed. These movements are additional to the Einstein displacement, which, as above stated, gives a shift of the lines equivalent to a downward speed of six-tenths of a kilometre. Although measurements have been made by other physicists and astronomers, some confirming and some denying the relativity shift, everyone has been waiting for St. John's pronouncement on the question, and will be willing to accept it as final, not only on account of his great skill and carefulness, but also because the instrumental facilities at Mt. Wilson are much superior to those of any other observatory or laboratory. That Dr. St. John has been one of the doubters as to the correctness of the relativity theory, and has, as it were, been convinced against his will of the reality of the Einstein spectral line displacement, only makes his final conclusion more certain of general acceptance as the last word on the question.

While many astronomers and physicists have been unwilling to accept the general theory of relativity so long as the three astronomical predictions of Einstein were unconfirmed, this proof of the third prediction hardly leaves any stable basis of opposition, and although the irreconcilables may still claim there may be some other explanation of the observed facts the proof provided by the observation of two previously unsuspected phenomena theoretically predicted by the relativity theory and the explanation given of a previously unexplainable anomaly in the motion of Mercury, furnish such a high probability of the substantial correctness of the relativity hypotheses as should place the doubters very much in the minority.

While it is probable that the present enunciation of the principles of relativity is not the final one, it furnishes such a complete and satisfyingly logical explanation of the fundamental facts of nature as to at least make a good working hypothesis, and though the present generation of physicists and astronomers may find difficulty in accepting and using this great generalization, this difficulty will disappear with time.

Results Attained

After the four addresses of the symposium, reports of the results of eclipse expeditions were received. Apparently the only results of any great scientific value were obtained by the Swarthmore expedition which secured some fine photographs of the Corona and also some plates for the relativity bending of light, which were reported on and shown by Prof. S. A. Miller. Prof. Douglass, of the Steward Observatory, also obtained some coronal photographs, and it was reported that the German expedition, Lundendorff and Kohlschutter, had been successful. The stations in the interior of Mexico, where the meteorological conditions were supposed to be much less favorable than in lower California, obtained successful results, while in sunny California, whose climatic reputation has been somewhat damaged by the failure, the sky was completely clouded along the whole path of totality. The programme for the day was completed by a splendid evening address by Prof. Lewis, of the University of California, giving a popular exposition of the principles of relativity and presenting the subject in an understandable and fascinating manner to a general audience.

The meetings of Tuesday were held in Pasadena, in the morning in the library of the Mt. Wilson Observatory Laboratory, and in the afternoon in joint session with the American Physical Society in the Norman Bridge Laboratory of the California Institute. Five papers on general astronomical subjects were given at the morning meeting, of which probably the most interesting and important, at least to the writer, was the paper by Dr. P. W. Merrill, of the Mt. Wilson Observatory, on the "Radial Velocities of Long Period Variable Stars." This paper is the result of several years' observations of these stars and summarizes the velocity results for 135 stars. The average velocity is considerably higher than for the regular M-type stars and some correlation between velocity and period and between the velocities given by bright and dark lines were obtained. Dr. Merrill is continuing his investigation to obtain some physical relationships, and it is certain that our knowledge of these enigmatic objects will be much increased when his work is completed. Dr. Aitken gave a paper on the hypothetical parallaxes of 135 double stars, and Dr. Luyten deduced some interesting conclusions in regard to our nearest neighbors in space. Dr. Towniey gave details of a new catalogue of variable stars now in preparation, and Dr. Adams presented papers dealing with the motions and parallaxes of the Praesepe cluster and of the mean parallaxes of certain groups of stars.

Magnetic Action

After a dainty luncheon, provided by the observatory, the members were driven to the Norman Bridge Laboratory, where the afternoon meeting in joint session with the American Physical Society was held. Papers on physics and astronomy alternated in this programme and those of general interest to both sciences only were selected for this afternoon.

An interesting and valuable paper by Nicholson and Pettit, of the Mt. Wilson Observatory, on the radiation from stars and planets as measured by a differential thermopile and photographically recording sensitive galvanometer showed promises of very important results soon being available. Father Rodes, of the Observatory del Ebro, Spain, presented a paper showing very distinctly the correlation between solar magnetic storms and terrestrial magnetic action. Dr. J. A. Anderson described a method for obtaining electrical discharges of high ionizing power by the discharge of a very large condenser through metallic terminals in a vacuum. A very large number of new spectral lines are shown in many of the metals, especially calcium and lead, where there are hundreds of them. These new lines must be a product of super excitation, and the method promises developments of great importance. One of the most striking and startling of the results presented at this meeting was, however, a paper by Gustaf Stromberg, of the Mt. Wilson Observatory, on "Asymmetry in the Distribution of Stellar Velocities." His conclusions result from a statistical investigation of the space velocities of a large number of celestial objects made possible by recent researches at Mt. Wilson and elsewhere, and indicate that there is a preferential direction in space along which celestial motions tend which is in apparent contradiction to the theory of relativity, according to which no absolute origin or direction can be chosen or found in space. The velocities of all celestial objects are directed almost wholly towards one hemisphere of the celestial sphere, but the physical meaning or cause of this preferential direction is not yet apparent.

Great Developments Pending

We appear to be just on the verge of tremendous developments in science, and it would be rash to make any statements or attempt any prediction of the ultimate trend of these developments. It is at any rate obvious, even if the three predictions of Einstein have been fulfilled, that the end is not yet, and that it will be wise to maintain an open mind on the whole subject.

Perhaps the most interesting and profitable, and certainly the most enjoyable, of the meetings was held on Wednesday at the Mt. Wilson Observatory. Stages left the laboratory at Pasadena at 9 a.m. and arrived at the summit about 11 a.m., after a very enjoyable, and to those who had not previously experienced it, a rather thrilling drive. After walking around the observatory grounds, riding in the bucket to the top of the 150-foot tower, looking at the 60-inch and 100-inch telescopes and various other activities, an enjoyable and satisfying luncheon was served at the Monastery. The last and final session was held in the 100-inch dome, a most appropriate and unusual place for an astronomical meeting. All the papers at this meeting were very appropriately and suitably presented by members of the Observatory staff, and included a paper by Dr. G. E. Hale, whose absence from the meeting at the observatory he had established was deeply regretted. The meetings were closed by the usual votes of thanks, which is in the case of the thanks to the director and members of the staff of the observatory was very specially and heartily responded to. Most of the members remained overnight and had the unusual opportunity and privilege of seeing such objects as the moon, the Hercules Cluster, the Ring Nebula, a planetary nebula, etc., through the 60-inch and 100-inch telescopes under excellent seeing conditions, a fitting and pleasant climax to a banner meeting.

Although the first part of this astronomical expedition, the observation of the eclipse, was such a dismal failure, compensation was afforded the disappointed would-be observers by the great success, the enjoyable character and the importance of the results of the after meeting. I am sure I am only expressing the sentiments of all fortunate enough to attend this memorable and most enjoyable meeting when I express my belief that it was one of the most successful meetings of the society. Every member attending must feel deeply grateful to Dr. Adams, the director, to his charming wife and to all the members of the staff for their hospitality and for the complete surrender of their time and effort towards the entertainment and instruction of their guests. Their kindness was deeply appreciated not only by the writer, but by everyone who attended, and the meeting will be long recalled as one of the most profitable and enjoyable of all the meetings of the society.

Lavender Fields

Sweet lavender, culled from the purple fields of Surrey. How I treasure my bunch gathered beneath the mellow sun of late August from the heart of a swaying ocean of blue and purple! For miles and miles on either side the lavender fields lay, fading afar in an indistinct blur where sky and herb merged into one.

The fragrance of a million blooms scented the air, rising in subtle waves as the gentle breeze stirred the glorious sheeny mass. I ran to greet a billow of purple wonder as it swayed toward me, gathering the blossoms close in my arms. I buried my face in the hazy disorder, drinking in long draughts the exquisite perfume. Overhead the silver notes of a thrush, mingled with the droning of an army of bees near by, and far across the fields the lazy hum of a haycutter as it fussed to and fro, made sweet music.

As the sun slid to the West, long shadows swept the fields, turning the lavender into deepest purple, leaving patches of pale mauve and bluish tints, where the sun still shed its golden rays; then darkness, and the fields were a sea of quivering purple stalks, moving gosthlike and silent, but ever the air was sweet with their scent.

A month passed and the lavender fields lay bare, shorn of their ethereal beauty; but the London streets were echoing with the melodious cry:

"Buy my lavender, sweet blooming lavender.
Six bunches for a penny today.
Lavender, sweet blooming lavender;
Ladies, buy it while you may."

Everywhere street sellers were vending the sun-kist lavender, of my beautiful Surrey fields; and passers-by hastily exchanged their penny for a fragrant bunch. Soon it will lie dry and forgotten. But my bunch lasts; always the funny little straight stalks compel me to re-live that glorious afternoon, when first I saw vast lavender stretches dancing and shimmering beneath a Summer sun.

The Last Citadel of Leisure Has Gone

"What shelter to grow ripe is ours? What leisure to grow wise?

"We presume it would be generally admitted that one of the most potent factors that make for breadth and urbanity in literature is leisure," says The Literary Review. "Ripeness of thought and mellowness of emotion are a product of slow generation, and require for their gestation a period of protection from the impact of a rough and tumble civilization. That otium cum dignitate of the ancients, which nourished the genius and released the grace of philosophers and poets, finds small counterpart in our contemporary society.

"In England, to be sure, even in the industrialized England of today, it still persists to a certain extent adhering in the British aristocratic tradition which imposes a sense of obligation upon its favored classes the while it confers upon them the privilege of a respected idleness. But in America leisure is either the discreetened prerogative of the very rich or the misfortune of the unemployed. It has never had countenance in this country, and latterly even the one institution that had been able to supply not leisure but the comparative quiet that in some ways offered its opportunities to the brooding spirit has lost its hold upon it. For our universities no longer sit detached on the heights of learning.

"His would indeed be a rash commentator who would venture to say that this translation of the university from aloofness to integration with the general community life has worked an ill to literature. But it is obviously working a change in it. For the academician now no more than the business man or the lawyer has time for that play of mind and spirit that the ampler days made his.

"If he has the means to live on his college salary alone he still must supplement his university work with lecturing or writing or sitting on committees, or else run the risk of being regarded as a mere doctrine scholar. If he has not independent means he must do so as a matter of necessity. In either case his margin of free hours is cut down to a deporable degree, and creative work on a larger scale becomes increasingly difficult. The last citadel of leisure has gone."

The Plain Man and His Editor

"Letters often reach us," says The Times, "which begin thus: 'Allow a plain man to say a plain word' concerning this or that matter of politics. The subjects chosen are generally of great technical difficulty. The plain men tell us in a few words how to stabilize German currency, how to stem unemployment, and how to conduct the diplomacy of Europe. To them it is all miraculously simple. They pride themselves upon their plain ignorance—far be it from them to share the guilty knowledge of the statesmen they despise—but they have a plain remedy for every ill. They cannot for the life of them understand why these remedies are not instantly applied. Why, for example, do not diplomatists speak their minds plainly as plain men do at parish meetings? That, surely, would solve all the problems of the world. After much more in the same vein, our plain correspondents gather their final emphasis, and repeat, Sir, that they are disgusted.

"Now this brotherhood is clearly a formidable group which stands in need of nicer definition than has yet been given to it. Who is the plain man and what is his plain purpose when he turns aside from his disgust? Where does he live? What is his business when he is not occupied in plain speaking at parish meetings? Has he a feminine counterpart in the plain woman who expects the affairs of Europe to be conducted with that direct simplicity which her experience has proved to be effective at the Dorcas Club?

"First, without doubt, he is modest, bold, and accomplished—modest because he is willing and eager to confess that to him and his brethern this business of politics, as he scornfully calls it, means absolutely nothing; bold because he nevertheless writes about it; and accomplished because, by his own claim, he has a rare gift, often vainly sought after by philosophers, of saying plainly what he thinks.

"How are they to be treated? What reply is possible? 'I am a plain man, and what I say is——' Perhaps there is no better retort than that of the parish meeting itself, which, on such an occasion, in obedience to immemorial custom and with tactful concealment, falls unalarmedly asleep," concludes The Times.

LIGHT-HEARTED MURDER

It seems to be a singular and an anomalous fact that at the same time that this casual and commonplace view of the taking of human life has grown up in the mind of the criminal—who, like the poor, we have always with us—the general public has become increasingly squeamish and sensitive about taking the lives of murderers. One would say that the two sentiments had marched side by side—the perfect willingness of the wrongdoer to put anyone to instant death that crosses his path, and the reluctance of the general community to inflict upon the criminal the fate to which he so cheerfully consigns all and sundry who oppose him. Time was when men were sent to the gallows for stealing a rabbit. But now it is hard to bring to the supreme retribution the most dastardly and indubitably guilty of murderers. How do we account for this greatly heightened sensitiveness about the taking of human life at one end of the moral scale, and the increasing indifference at the other end of its appalling significance?—Boston Transcript.

The Florence Lake Tunnel now being bored in California, will, when completed two years hence, be twice as long as the Rogers Pass tunnel on the Canadian Pacific Railway—the longest tunnel in the New World—and a mile longer than the famous Simplon tunnel through the Alps. It will not be used by a railway but instead will deliver water to the Big Creek No. 3 hydro-electric generating station in the San Joaquin Valley. Thus the amount of electric energy this station is now producing will be doubled.

English elections have a habit of being critical, though sometimes the fact is not recognized at the time.

Scientific and Industrial Development

British Empire Exhibition

LONDON, Nov 1.—It is now possible to give some details of the methods by which the various industries will be represented at the gigantic Wembley grounds when the British Empire Exhibition opens in April next. There are two arrangements for exhibiting in force. In the one instance a central organization arranges the exhibits of individual firms in that particular industry, and the other method is for a similar body to manage a collective exhibit of firms as a whole. A particularly happy example of this latter arrangement is that of the motor industry. In this case a collective exhibit representing all branches of mechanically-propelled transport vehicles, ranging from heavy commercial vehicles to lightweight motor cycles, will be staged by the Society of Motor Manufacturers and Traders in collaboration with the British Cycle and Motor Cycle Manufacturers and Traders' Union. The vast work of organizing the mechanical engineering section of the exhibition is, of course, in the hands of the British Engineers' Association, whose president is Mr. E. W. Petter, the chairman of Petters, Limited, Yeovil, and managing director of Vickers-Petters, Ipswich. Mr. Petter has traveled extensively in many parts of the world and is keenly interested in the development of overseas trade. Similarly, the electrical section is in the capable hands of the British Electrical and Allied Manufacturers' Association. At the time of writing I learn that practically all the available space in the Palace of Engineering has been booked, which means that an area about six times the size of Trafalgar Square, and covered by the largest concrete building in the world, will be filled with the latest developments in British engineering.

Shipyard Electrification

LONDON, Nov. 1.—Post-war conditions in the shipping industry emphasize the absolute necessity of bringing the equipment of British shipyards to the highest point of efficiency in order to reduce working costs to the minimum and enable Great Britain to compete successfully in the world markets. With this end in view, a comprehensive new scheme of electrification was recently put in hand at the ship repairing yard of Smiths' Dock Company, Ltd., at South Shields, close to the firm's other Tyneside yards, where the activities include engine building, manufacture of low-pressure oil-burning plant, forced and natural draught plant, and so on. At the yard in question the 550-volt D.C. traction supply originally installed had proved inadequate for modern requirements, and plans were made with the local Corporation Electricity Works for a 2,200-volt 50-cycle three-phase supply with earthed neutral. This supply is brought to a sub-station which contains three transformers, two of 500 K.W. for power supply, and one of 75 K.W. for lighting, the line voltage of the latter being 15. The incoming supply on the high tension side of the transformer is controlled by a steel boiler-plate cubicle switchboard conforming to the latest Home Office requirements and ensuring the maximum degree of safety possible. Interlocking arrangements make it impossible to open the door of the cubicle until the oil switch is "off," or to close the switch when the link chamber door is open. The distribution pressure on the low tension side of the power transformers, which operates throughout the yard and workshops, is 440 volts. Apart from the dry-docks, a considerable area of this yard has to be devoted to machining operations, etc., which necessitates the provision of Smiths' fitting, carpenters' and plumbers' shops. These departments are supplied throughout with electric motors, mostly of the Squirrel cage type, for driving the various machinery. For the most part, these motors are of 15 to 30 h.p., but an interesting exception is a 100 h.p. motor driving the main plate bending rolls, which are capable of dealing with plates 25 feet long and 1 inch thick. A considerable saving in both space and cost has been effected by the installation of electric in the place of the previous steam drive. The whole of the motors switch and control gear described were manufactured at the Witton Works of the General Electric Company, who acted as the main contractors for the scheme, the majority of the cabling being made by the Pirelli General Works at Southampton.

British Engineering

In certain branches of the textile trades and in the manufacture of soap and biscuits this country still may claim to hold the position which tradition would accord to her, but when one turns to the great engineering trades such claims demand careful examination and some modification. In certain lines of work which for convenience one may cover by the term "general engineering" our position is probably as strong as ever. For cranes, steam engines, boilers and other such types of machinery, which are usually built singly or in small quantities, we have no need to look to, or defer to, any other country. When, however, one considers machinery of the smaller type which is produced in large uniform quantities the position is far from equally satisfactory. It is usual to instance the motor car trade when referring to this matter, but motor cars form by no means an isolated instance. The typewriter is a glaring case of an engineering product which for some reason we fail to make for ourselves, and there is no difficulty in finding others. Far too many sewing machines and machine tools are imported into this country. Engineers' small precision tools form another case, while as an example of a machine of quite a different order of accuracy one may turn to the lawnmower with imported examples of which this country is flooded.

It is not easy to understand why the country which invented the factory system has in one important trade so signally failed to take full advantage of the developments to which it has led. There is clearly nothing in our atmosphere or in the mentality of our labor which prevents engineering manufacture in the manufacturing sense being made a success here, as is sufficiently made evident by the position now held by the bicycle and motor bicycle trades. These trades are not only holding their own at home, but are exporting to an important extent. This is as it should be, and it is of very grave importance for our national future that the manufacture of other of the engineering articles which have become of everyday domestic use should develop to the same satisfactory extent. The bicycle trade is an older trade than the motor car trade, and it may be suggested that sufficient time has elapsed for the incompetent manufacturers to be weeded out. These people were doing themselves no good and were spoiling the market for their more competent rivals. There may be something in this, but it is not very satisfactory to have to think that the country which invented engineering requires a generation to find its feet in a new line of manufacture.—Engineering, London.

Raising Sunken Ships

Sunken treasure ships and schemes to raise them never fail to awaken a sense of romance and advanture in all of us. Many have spent their lives in evolving plans to "jimmy" Davy Jons' locker and get the hoarded treasure. But Davy has been a jealous guardian. Though the entire resources of whole nations have been employed in the attempt to recover this treasure only a small portion of it has ever been salvaged. Jones' challenge has remained unanswered until now.

Will the new Reno Marine System conquer the seas? This is still a question, but many who are in a position to know seem to think it will.

Jesse W. Reno, a well-known American engineer and inventor, has designed a new equipment electrically operated with which he expects to reclaim the immense stores of wealth which now lie fathoms below the surface of the sea. Particularly during the late war were many valuable cargoes sent to the bottom. Along the British coast alone 4,000 vessels are reported to have been sunk by submarines.

This new system has already worked successfully in raising a boat out of about 60 feet of water in Long Island Sound, and England has made arrangements for the raising of the most valuable of her merchantmen sunk during the war.

"Aren't you going to raise the Lusitania or the Titantic?" Mr. Johnson of the Reno System was asked.

"For the present we have too much work along the coast of England to attempt anything as dramatic as the raising of the Lusitania. As for the Titantic, that is not to be thought of for a long time, because she sank considerably further from and and is probably about three or four miles below tha surface. Our present equipment only operates from 400 to 1,000 feet below the surface of the water."

Mr. Johnson then walked over to a large tank filled with water which stands in the corporation offices and proceeded to damonstrate the new device.

"The reason most of the salvage systems of the past have proved unsuccessful is that they were hampered by a dependence on surface devices and because there is a limit to the depth at which divers can work efficiently," he explained. "Fortunately our system is hampered by neither of these factors because we can build our equipment as sturdily as the depth at which the ship is lying requires."

The system, simply described, consists of a tractor driven by electric motors and equipped with motor-driven heavy duty drills. An electric cable from the "mother ship" supplies the current for all motors. This enables the tractor to move about on the bed of the ocean and also provides the driving force for the drills.

Once down the tractor proceeds into place alongside of the sunken ship, the drills commence boring a series of holes in the side plates. To these are attached long steel cylinders open at the lower end. When sufficient cylinders have been affixed to each side of the sunken ship the water in the cylinders is forced out by pumping air into them. As they fill with air tha ship gradually rises toward the surface. Tha air having displaced all of the water in the cylinders the ship is then riding with decks awash and can be towed to the nearest port, where the salvage work may be completed.

The tractor itself weighs 20 tons in the air and ten tons under water. It carries a crew of two men. The working chamber, nine feet high and seven feet in diameter, is ventilated by the same system used in submarines. The electric cable from the mother ship contains four wires, two for telephone use and two for power. The drill shafts project from either side of tractor and the tools employed are a combination of drill and reamer. These cut a hole large enough for the sturdy lifting T-hooks of the pontoon. Each pontoon carries two of these hooks requiring that four holes be drilled in the side of the ship. It takes an average of two hours to drill one set of four holes. To raise a 2,000-ton boat would necessitate using 16 pontoons, each having a lifting capacity of 200 tons.

Work has already begun on the raising of British ships, and plans are being completed for the probable recovery of the Spanish galleons sunk in the Vigo Bay worth, it has been estimated, about $120,000,000. The Turkish and Egyptian fleet which was sunk by the British in Navaro Bay, and a great many other famous sea treasures may also be raised in this manner.

How He Got His Name

Many ministers could, from personal experience, tell of strange names bestowed upon infants at their baptism, but few could equal the following story recently told by the Bishop of Sodor and Man. A mother who was on the lookout for a good name for her child saw on the door of a building the word "Nosmo." It attracted her, and she decided that she would adopt it. Some time later, passing the same building she saw the name "King" on another door. She thought the two would sound well together, and so the boy was baptized "Nosmo King Smith." On her way home from the church where the baptism had taken place, she passed the building again. The two doors on which she had seen the names were now closed together and what she read was not "Nosmo King," but "No Smoking."

No doubt citizens of the new Rhineland Republic will have to develop a new language, perhaps a cross between German and French, if they can get words to mix without fighting.

PARK SAFETY RAZOR