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NEW YORK, SATURDAY, NOVEMBER 14, 1903.

The editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp, the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

THE SCIENTIFIC AMERICAN AND THE SUPPLEMENT.

WE have received a letter from a subscriber to the SCIENTIFIC AMERICAN who complains of the fact that occasionally, after having his interest aroused in some article published in the parent paper, he finds himself referred to the SUPPLEMENT for fuller details; and although no specific request is made that the SCIENTIFIC AMERICAN and the SUPPLEMENT shall be thrown into one, the context makes it clear that this is the thought that is in his mind. The criticism is frank and evidently friendly, for in his opening sentence the writer says: "I think your journal the best of its kind ever published, and I have been a subscriber for over twenty years, in which time I have induced a number of friends to become readers of your paper." It is possible that other readers of our journal may have asked themselves the same question as our correspondent, and in explanation of the course that we follow, if any should be thought necessary, we offer the following considerations:

It will be generally conceded that the SCIENTIFIC AMERICAN holds a unique position among the scientific publications of the day. When the enterprise was started, now over half a century ago, it was realized that there was a call for a scientific publication of a more popular character than those which were devoted to special branches of science and industry, and were written for purely professional people; and it was the belief of the original founders of the paper that it would be possible to offer to the public, week by week, a digest and discussion of the current happenings in the scientific world which, while it was so thoroughly accurate and reliable as to command the interest and attention of those readers of scientific literature whose theoretical knowledge and practical skill placed them in the very front rank, should yet be so carefully edited, and the matter presented so judiciously selected, as to render it intelligible and useful to that great majority of the American public who have neither the opportunity nor the means to devote more than a limited time to keeping abreast of the world's industrial progress.

It will be realized at once that to conduct a scientific journal successfully upon these lines, and at the same time keep it within reasonable dimensions, called for a very careful selection of material and involved, necessarily, the rejection of a large amount of current literature which was of too special a nature to warrant its insertion within the covers of a popular scientific journal of the kind proposed. In the first twenty or thirty years of the paper's existence, when the field of science, mechanics, and engineering was far more limited than it is to-day, it was possible to include in the paper a large amount of scientific information and literature which, as the field broadened, the number of learned societies multiplied, and the outflow of lectures, treatises, and papers grew to its present dimensions, it was absolutely impossible to publish except in a form so abbreviated that the value of the matter would be practically lost. In order to meet the difficulty it was decided to publish an overflow journal, which should appear contemporaneously with the parent paper. From the time of its very first issue, the venture has proved to be a very successful solution of the problem. The circulation has increased to a volume which proves the wisdom of the policy adopted, and it is a fact that nearly the whole of the subscribers to the SUPPLEMENT are also subscribers to the SCIENTIFIC AMERICAN. Not only has the publication of the SUPPLEMENT served to take care of the overflow, which includes some of the choicest scientific and technical literature of the day, but, by excluding a large amount of matter which, in its very nature, was too abstruse or too special for a

large class of our readers, it has enabled the editors to include in the SCIENTIFIC AMERICAN a larger amount of that more popular technical literature that has served to bring the paper to its present standing.

In order to enable all the readers of the SCIENTIFIC AMERICAN to take the weekly SUPPLEMENT also, a combination rate has been arranged by which the subscribers receive a larger amount of technical literature than is offered for the same consideration by any of our contemporaries at home or abroad. We do not hesitate to challenge comparison on this score with any of the better-known foreign technical journals; and if any reader wishes to estimate on the basis of amount received for a given subscription, he will find that the SCIENTIFIC AMERICAN and the SUPPLEMENT together contain as much reading matter as is offered for the same sum by any other technical journal. As to the matter of cross reference from the SCIENTIFIC AMERICAN to the SUPPLEMENT, we can only say that it follows naturally from the very necessities of the case that have led us to the publication of two separate journals instead of combining them in one. Thus, in the case of some epoch-marking discovery, such as that of X-rays or of radium, it invariably happens that the first authentic announcement comes in the form of a profoundly philosophical or technical paper read by the discoverer before some learned society. In such a case, it is our custom to present an editorial review of the subject, in which the essential features of the invention or discovery are described, and a brief digest of the paper itself is given. At the same time, there will be a considerable portion of the reading public that will wish to read the paper itself, and accordingly the latter is published in the current issue of the SUPPLEMENT, a cross reference to the same being made for the guidance of the reader. The policy has worked so well, and has proved so acceptable to our readers, that we feel satisfied that we shall be justified in its continuance.

DELAY IN THE CONSTRUCTION OF NAVAL SHIPS.

The dominant note in the annual report of Rear-Admiral Francis T. Bowles, Chief of the Bureau of Construction and Repair, whose recent resignation from the navy we must all greatly deplore, is one of regret at the continued existence of the trouble which has always hampered the great work of building up the new navy of the United States, namely, the extreme slowness of construction. To the average citizen, whose mind is just now impressed with the absolutely chaotic condition of things in the shipbuilding industry, it will not be surprising to learn that the new warships that are under contract to be built in private yards are from twelve to fifty-three months behind the contract date of completion. On the other hand, the delay antedates, in some cases by several years, the period of wild-cat speculation and most questionable stock jobbing which is chiefly responsible for the present shipbuilding troubles. Thus, in the case of the torpedo-boat destroyers, six of which are from four to four and a half years behind, the delay is to be attributed chiefly to the inexperience of our shipbuilding firms in the difficult construction of these delicate vessels. Many months ago the Bureau of Construction, realizing the impossibility of the boats being brought up to contract requirements as to speed, suggested that the standard of speed for acceptance be lowered; but judging from the fact that there are a half dozen of these boats still on the builders' hands, it is evident that the failure is even more complete than was suggested. It is not only the torpedo boats that are badly behind time; for the "Ohio," a sister ship to the "Maine," is now thirty-three months behind the contract time, and will probably not be completed until the early summer next year, while the sister ship "Missouri" is about two years behind time. The five vessels of the "Georgia" class are from fifteen to eighteen months behind time, and we hear the same discouraging story as regards the other class of vessels. Armored cruisers are delayed from five to nineteen and a half months, and protected cruisers from twelve to twenty-one months behind time. Just here it should be noted that of all the battleships that are under construction, the only one which is not seriously behind time is the "Louisiana," now building at Newport News. The significance of this exception lies in the fact that the sister vessel, the "Connecticut," is now being constructed at the New York navy yard; and while it is not officially acknowledged that there is any competition between the government-built and the private-contract ships, the public will surely be justified in drawing the conclusion that the building of ships in government yards has a very material stimulating effect upon private contractors. Years ago we supported the late Admiral Bowles in his contention that government-yard construction would serve as a great stimulus to private contractors, and we believe that had the practice been in force at the time the present contracts were given out, there would have been no such delinquent list as now disfigures the annual naval report.

DEATH OF PROF. MOMMSEN.

Germany's famous historian, Prof. Theodor Mommsen, died on November 1. Prof. Mommsen had a varied and interesting career. He was born at Garding, Schleswig, November 30, 1817, and received his early education from his father, a Protestant clergyman. After the usual course at the Gymnasium, he studied at the University of Kiel. Whatever poetic aspirations Mommsen may have had in his youth were nipped in the bud, for a book of verse which he brought out with his brother, Tycho, received the general condemnation of the reviewers. At the age of twenty-five Prof. Mommsen was made a doctor of philosophy. The following year saw the publication of his "De Collegiis et Sodalitatibus Romanorum," which began his career as a historian. The book was characterized by a certain grace of expression that had not theretofore been encountered in German histories. The same characteristics are to be found in his later works and soon established his reputation. Later his historical work became infused with a certain bitter irony that enlivened many a dry page of historical narrative. From history he branched out into politics and became a radical propagandist for constitutional progress. Such was the violence of his attacks against the prevailing order of things that the government found it necessary to arrest him. He was acquitted eventually by the courts; but he lost his professorship.

A man of Mommsen's remarkable ability was not long idle. He received a call from the faculty of law at Zürich. It was in Switzerland that he began his history of Rome. In 1854 he was appointed professor of Roman law at Breslau. Four years later he was called to the University of Berlin. Mommsen was one of Bismarck's bitterest enemies. He attacked the "Iron Chancellor" time and time again in speeches which, in the eyes even of his friends, sometimes overstepped the bounds of professorial dignity. He characterized Bismarck's tariff policy as a pure swindle. To defy Bismarck was serious enough; to call him a swindler was hardly to go unpunished. Naturally enough Mommsen was arrested and tried for slander. The courts, after a hard fight, decided in his favor. It was one of the great triumphs of his life.

Mommsen's characteristics as a historian, as we have pointed out, are above all his lucidity of style and his wonderful thoroughness. Throughout his whole life he remained a student, always unearthing new things, always learning. Often enough students who had gathered at Berlin to listen to his lectures were doomed to disappointment; for the long-faced, lean old historian had gone off to Italy to gather more material about Rome. Fifteen years ago a complete list of his writings occupied some sixty closely printed pages. As the historian kept at his literary work after that time, the bibliography of his works has assumed even larger proportions. Something of the esteem and respect in which he was held by scholars throughout the world was evinced in 1880. In that year part of his library was destroyed by fire. From all parts of the world scholars sent contributions to replenish the collection.

ON THE THEORY OF THE CRITICAL STATE.

Some facts observed by De Heen, Galitzine, Batelli, and others are at variance with Andrew's theory of the critical state. De Heen has, e. g., shown variations in the density up to 100 per cent to be present in the same tube, above the critical temperature and at constant temperature and pressure. As, however, the experimental conditions under which the densities were determined are somewhat doubtful, it was interesting to test these results by a new method free from such uncertainties, this method consisting in determining the density both below and above the critical temperature by means of small glass balloons ascending inside of the tube in question. Similar experiments, as recorded in a paper read at a recent meeting of the German Physical Society, were carried out by J. Traube and H. Teichner, a complete scale of small glass balloons of different densities being prepared. The densities of the balloons were determined by ascertaining the temperature at which the balloon would become suspended in heated ether. Experiments showed that the balloons, as far as 10 deg. above the critical temperature, would be kept for hours in suspension at different heights, corresponding with their density and that of the surrounding medium, thus indicating differences in the density as high as 50 per cent and more, though a perfect equilibrium both of pressure and temperature be prevalent. Evidence was thus shown of the incorrectness of Andrew's theory, as in accord with De Heen's experiments different densities may coexist at the same pressure. Two different matters must accordingly coexist at the critical temperature, one being liquid and one gaseous, the critical temperature having to be considered as the point at which both matters are miscible in any ratio, whereas a partial miscibility has been observed at temperatures far below the critical point.