mgs per 100 cc. The ages of the idiots range between eleven and forty-four. Obviously diet was carefully considered. Acid soluble phosphates, lecithin, percentage hemoglobin, red cell count and cell volume have been found to be within the normal limits also. Our results indicate that there is some variation from the normal in the cholesterol content.

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DRAWINGS FROM PHOTOGRAPHS

To Professor Naylor's method, given in SCIENCE of January 2, 1931, for making drawings from photographs, we wish to add two suggestions which greatly increased the efficiency of this method for us: First, use grade A No. 2 Carbon Azo or other make of equal grade; and second, slightly overexpose and underdevelop the print which is to be inked in.

G. E. MACGINITIE

HOPKINS MARINE STATION

QUOTATIONS

INDUSTRY AND SCIENTIFIC RESEARCH

ALTHOUGH many of the branches of organic chemical industry have sprung from the discoveries, often fortuitous, made in scientific laboratories—as, for example, Perkin's mauve, Griess's azo dyes, Baeyer's phthaleins and synthetic indigo, Knorr's antipyrine, Ehrlich's salvarsan, the nitrocellulose silk of Count Chardonnet, the viscose of Cross—the significance of such discoveries was frequently unrealized at the time either by scientific workers or industry. This alone should make us cautious in advocating any restriction of research. There are too many problems in our national and industrial life urgently demanding scientific solutions for such a policy to be either timely or wise. It is almost impossible to predict just where the next important advance will be made, or, in reviewing the results of a year's investigations, to single out the one discovery by which posterity will mark the year.

The influence of industry on scientific research is, however, fully as important as that of scientific research on industry. Even in the field of technique it is impossible to assess the contributions of either on a cash basis. The greater resources of the industrial research laboratory and its improved and frequently more advanced technique are continually reacting on scientific laboratories. The range of reaction conditions open to the organic chemist has enormously expanded in the last decade, and processes can now be effected in extremely high vacuum or under pressures of several thousand atmospheres and at temperatures ranging from the neighborhood of absolute zero to those of the electric furnace; whilst the activators or catalysts available range from the new organic catalysts, bordering on biochemistry, over almost the whole field of inorganic chemistry.

Nor is it only refinements of technique that are continually changing the conditions of scientific and industrial research. Almost every year sees fresh compounds, formerly curiosities and accessible only by tedious and costly laboratory processes, produced on the commercial scale at a price which allows their use in industry or in scientific laboratories as the raw material of further researches. The papers published in the journal of any chemical society reveal the way in which the scope of scientific research has been enlarged and influenced by industrial advances. The utilization of waste materials, the delicate balance between by-product and main-product, the fall or rise in price of basic materials like sulphuric acid, methyl alcohol, glycerol, which alone may result in new routes for existing products—the war-time shortage of sulphuric acid, for example, led to the development of alternative processes for phenols and amines which have not been entirely replaced by the earlier methods—these are factors which continually emphasize the dynamic character of industrial research and frequently have far-reaching effects on scientific research.

If, however, the increasing complexity of the field of organic chemistry makes restriction of research inconceivable, the demands made on leadership are increasingly severe. It was never easier than to-day for research ability to be wasted in an attack on unprofitable problems. Scientific progress has almost invariably come from the ideas and work of a talented few, and depends as much upon the quality and personality of the investigator as upon his technique. The most serious problem is the production of research leaders of the requisite imagination, foresight and enthusiasm to direct wisely the team work which modern industrial research demands. Any circumstance, whether of rates of pay, status, or insecurity of tenure which hinders the recruitment for industrial research of potential leaders of the requisite calibre is a national and not merely an industrial danger. There is little doubt that if the concentration of professional opportunities within at most one or two firms, as in Germany, does affect adversely the position and prospects of chemists, industry will quickly suffer from the reaction.

The distinction between scientific and industrial research to-day is not easy to define. Their relationship is dynamic and so intimate that circumstances which

injure or cramp one react likewise on the other: neither can advance while the other is starved, and on this fact Professor Willstätter based his plea for more generous assistance for the German universities from chemical industry. Such assistance is now being given more freely in Great Britain, and the closer relationship between the universities and industry are undoubtedly to their common advantage.

It is easy, however, to overstress from either side the economic aspects of the relation between industry and scientific research. If there are ways in which scientific research can not compete with industry, there are still inestimable services which scientific research can render to the nation as well as to industry. Scientific research, in its freedom from the economic motive, can do much to counteract that tendency in industry for the good to be the enemy of the best, and to secure our advance to the best of all possible solutions. Scientific research, in the widening fields opened to it by industrial developments, can use its resources to explore the byways, the economically unattractive fields from which will come in the future, as they have so often in the past, the fundamental and epoch-making discoveries. On such workers, too, in their quest of truth for truth's sake, must ever fall the responsibility of kindling and rekindling that enthusiasm and devotion to which alone nature yields her most precious secrets.—*Nature.*

SOCIETIES AND ACADEMIES

ANNUAL MEETING OF THE OHIO ACADEMY OF SCIENCE

THE annual meeting of the Ohio Academy of Science this year took the form of a joint meeting of the Ohio, Indiana and Kentucky Academies of Science and was held at Miami University, at Oxford, Ohio, on April 2, 3 and 4. The meeting was sponsored by the Sigma Xi Club of Miami University, which conceived the idea of inviting these three academies to visit Oxford, which is admirably situated about equidistant from the capitals of the three states. About four hundred members of the combined academies were present and a very pleasant and profitable meeting was held. Miami University, with her admirable dormitory system and commissary department, was able to handle the guests very comfortably and in a homelike manner.

On Thursday afternoon a field trip was planned and conducted into the Cincinnati area by Dr. William H. Shideler to study pre-glacial and post-glacial stream valleys. Inclement weather somewhat interfered with plans for collecting, but an interested group was in attendance. The same evening an illustrated lecture on "Traces of Early Man in Western Europe" was given by Professor F. O. Grover, of Oberlin College, followed by a social hour.

The program on Friday morning, April 3, opened with three addresses by the presidents of each of the academies. President August Foerste, of the Ohio Academy, spoke on "Ancient Life in the Arctic." President J. J. Davis, of the Indiana Academy, gave an interesting talk on "Points of Historical and Natural Interest in Indiana." This was followed by a talk by President V. F. Payne, of the Kentucky Academy, on "An Optimistic View of the Evolution of Science."

The talks of the presidents were followed by a motion picture of "The Colorado from the Air," given by Professor A. A. L. Mathews, of Oberlin College. Many demonstrations and exhibits attracted the attention of the members for the rest of the morning as well as during the course of the meetings.

The presentation of papers occupied Friday afternoon and Saturday morning. Six sections presented 124 papers, distributed as follows: Zoology 21, botany 19, geology 27, medicine 14, psychology 15 and physical science 23. The Akron Physics Club and the Central Physics Club met with the physical science section.

Business sessions were held by the Ohio Academy as well as by the Indiana Academy. Seventy-one new members were elected.

The following officers were elected for the coming year:

President, Alpheus W. Smith, Ohio State University.

Vice-presidents, J. Paul Visscher, Western Reserve University, *Zoology;* Arthur T. Evans, Miami University, *Botany;* E. M. Spieker, Ohio State University, *Geology;* Shiro Tashiro, University of Cincinnati, *Medical Science;* H. B. English, Antioch College, *Psychology;* F. G. Tucker, Oberlin College, *Physical Science.*

Secretary, Wm. H. Alexander, Weather Bureau, Columbus.

Treasurer, A. E. Waller, Ohio State University, Columbus.

On Friday evening a banquet was served to more than three hundred members of the participating academies. An address of welcome by President A. H. Upham, of Miami University, was responded to by the presidents of each of the academies as well as the presidents of the attending physics clubs.

Dr. Arthur T. Evans was chairman of the social committee on arrangements.

WM. H. ALEXANDER, *Secretary*
WEATHER BUREAU, COLUMBUS