PHYSICS

New Way to Look at World

Two physicists propose a new approach in the most recent attempt to bring order and reason to physical theory. It is expressed in mathematical formulae.

➤ THE latest way of looking at the world is to apply different laws—or different sections of the same law—to the subatomic realms and the great, big universe.

The mathematicians and physicists who are puzzling out the meaning of cosmic-ray mesons and other mysterious particles within the atom are discussing the most recent attempt to bring order and reason to physical theory. This is a report in the British journal, NATURE (Feb. 5), by Dr. Max Born, leading German physicist in pre-Hitler days, now head of the department of mathematical physics at the University of Edinburgh, Scotland.

With a collaborator, Dr. H. S. Green, he has proposed a new approach to reconciling the relativity of Einstein and the quantum mechanics that is needed to explain the atom. Scientists have long striven for a mathematical unification for these two approaches, both successful in that they explain what happens in different spheres and predict what may be found experimentally.

The new Born-Green approach is still theory and it can only be expressed completely and accurately in mathematical formulae that constitute strange and impossible language to most of us.

But it boils down to this: The mathematics can be arranged so that the same relationship can be used for both the subatomic and macroscopic worlds. In the case of the immense spaces of astronomy, the trick is to accent where things are and to almost wipe out the velocity effects because comparatively the momentum or speed of things is very slow. That gives something related to Einstein's special relativity. Then getting down inside the atom and its elementary particles—electron, proton, neutron and now several kinds of mesons or mesotrons—the velocities become all-important and swift, approaching that of light, the speediest possible 186,000 miles per second. Position becomes fuzzy and indeterminate, which does not concern us so much because the distances are so very small.

Dr. Born uses what are known as Lagrangian equations in his approach, and he also calls into play a general principle of reciprocity which he formulated some years ago. This states that the ultimate laws of physics should be symmetric in space-time and momentum energy. When Drs. Born and Green developed general field theories along such lines, they came up with computations of masses of particles that correspond roughly with some experimental results upon mesons, the particles most recently found in cosmic rays.

Science News Letter, March 5, 1949

MINERALOGY

New Manganese Deposits

➤ THERE is plenty of high-grade manganese for the American steel industry in newly discovered deposits near the mouth of the Amazon river in Brazil, reports Dr. Kenneth E. Caster of the University of Cincinnati.

They are much nearer to America than most other foreign manganese sources, and their development would free the United States of a need for the Soviet supply.

Dr. Caster is a geologist of the university's graduate school and has just returned from four years in South America where he was engaged in research under the auspices of the U. S. State Department and the Guggenheim Foundation.

Manganese is an essential metal in the manufacture of steel alloys and it plays an important part in other products. The United States has domestic deposits but the known reserves are far too small to meet the demands. Over 1,500,000 tons are imported normally each year. Russia is the principal source of supply, with India, the Gold Coast of Africa, the Union of South Africa, Cuba, Chile and Brazil important. In prewar days Russia produced approximately one-half the manganese ore used in the world.

Brazil has a great deal of manganese, Dr. Caster states. Present mining is in two well-known areas, one in western Brazil near the Paraguay border, and one north of Rio de Janeiro. The deposits recently discovered are in the territory of Amapa between the Amazon and the Guianas, less than half as far from New York City as the other Brazilian deposits.

The Brazilian federal government a year ago authorized Brazilian companies to begin exploring these Amapa deposits. With its other deposits Brazil has much more manganese than needed to satisfy domestic needs. It is highly probable, Dr. Caster states, that these deposits may be of great and strategic importance to the U. S.

Metallurgical manganese ore produced in the United States during 1946 amounted to less than 135,000 tons, coming from seven states but the great bulk mined in Montana. Production in war years was considerably greater, reaching some 241,000 tons in 1944. This is a small amount when compared with the 1,749,000 tons of foreign manganese ore imported in 1946, a year in which imports exceeded normal.

Science News Letter, March 5, 1949

WILDLIFE-ENGINEERING

Life of Oyster in Shell Studied by New Device

➤ THE private life of an oyster or what goes on under the shell can now be studied by a new electronic device.

The instrument which permits study of the oyster without disturbing his normal shelled, and heretofore sheltered, life is called an ostreodynamometer. Movements of the oyster inside his shell are recorded on a paper as wiggly lines, which form an ostreodynagraph. They look something like the records made of the earth's movements by a seismograph.

The ostreodynamometer was reported to the journal, SCIENCE (Feb. 11), by H. Malcolm Owen and Robert M. Ingle, Jr., of the Department of Wild Life and Fisheries in New Orleans and Charles R. Maduell, Jr., Delta Electronic Equipment Company.

They explain that the new apparatus permits scientists for the first time to study normal oyster life.

Science News Letter, March 5, 1949

DELVING INTO OYSTER'S LIFE —This new electronic device, called an ostreodynamometer, permits the study of an oyster under its shell.