America indicate that the Tertiary genera and some species were much like those of the present; but the geographical distribution has in many cases shifted. Most remarkable is the occurrence in Greenland and Alaska, actually well within the Polar Circle, of fossils belonging to genera now found in warm temperate or even sub-tropical regions.

It is difficult to imagine any possible conditions of climate in which these plants could grow so near the Pole, deprived of sunlight for many months of the year. The occurrence of so many related species in the at present widely sundered southern continents can be explained only on the assumption of some former land connections. The theory of Continental drift has been proposed by several writers, notably the recent volume[1] of Dr. A. S. du Toit. du Toit is influenced by the work of Wegener, but differs from Wegener in assuming two primordial continents, a northern one, Laurasia, and a southern one, Gondwana, instead of Wegener's "Pangaea." From Gondwana were separated the four present southern continents, which finally drifted to their present locations. This theory would best explain most of the problems in the geographical distribution of the floras of the Southern Hemisphere.

DOUGLAS H. CAMPBELL

STANFORD UNIVERSITY

SCLEROTIUM BATATICOLA, A CAUSE OF DAMPING-OFF IN SEEDLING CONIFERS

Sclerotium bataticola Taub. was isolated from young Norway spruce seedlings by Dr. L. W. R. Jackson, pathologist at the Allegheny Forest Experiment Station, in 1935. He later turned over cultures of this fungus to the writer, who has found that it attacks the germinating seeds and early seedlings of Douglas fir (*Pseudotsuga taxifolia* Brit.), Norway spruce (*Picea Abies* (L.) Karst.), American larch (*Larix laracina* (DuRoi) Koch), and the following species of pine-jack (*Pinus Banksiana* Lamb.), red (*P. resinosa* L.), Scotch (*P. sylvestris* L.) and Western yellow (*P. ponderosa* Dougl.). The inoculation experiments were conducted in the laboratory and greenhouses at the Morris Arboretum of the University of Pennsylvania. Pre-emergence and post-emergence damping-off occurred in all species mentioned. *Sclerotium bataticola* was reisolated from all stages of damped-off seedlings.

Under the conditions of these preliminary experiments, the pathogenicity of *Sclerotium bataticola* was thus confirmed for the species of conifers mentioned.

SPENCER H. DAVIS, JR.

UNIVERSITY OF PENNSYLVANIA

[1] "Our Wandering Continents." London, 1937.

PHYSICS IN NAZI GERMANY

IN SCIENCE for November 1, there was published a letter from an unidentified correspondent in Russia, which seems to imply that the Nazi authorities in Germany condemn "theoretical physics" as "Jewish physics" because of its Jewish origin. Is it not far more likely that the present masters of Germany discredit those particular branches of theoretical physics which are commonly known as quantum theory and relativity because they do not find them useful, and call them Jewish to disparage the Jews?

We in America hate tyranny—whether it be tyranny of men or tyranny of ideas. We should accord abtruse theories respectful consideration if they are both honest and able attempts to account for observations not previously fully accounted for, but we should not permit them to tyrannize. Your correspondent, however, disparages Stork because "it is obvious that the author tries to refute the modern theory of quantum mechanics." Since when has this become an offense? Quantum theory has not been deified in America, and undoubtedly there are still "thirty thousand men in Israel" who have not bowed down before it. Endeavors to confirm the quantum theory are still made in abundance. Should the few who seek unification of science along other lines be disparaged as necessarily anti-Jewish?

The true status of these two branches of modern physics, so far as the general public is concerned, is about as follows: Even Mr. Einstein has not yet been able to reconcile relativity and quantum theory, though he has made the endeavor to do so almost a life work. There has been no derivation of the electromagnetic theory from the principles of quantum mechanics, although a reconciliation between the two was promised and has been hoped for. Even Bohr now says that quantum principles do not apply in nuclear physics.

Relativity has not been applied to any attempt to control phenomena. Quantum terminology has been adopted in spectroscopy, and is used in all spectral classification work, there being as yet no other. The "numerous remarkable discoveries" attributed to quantum theory are at least chiefly due to classification schemes, and not necessarily to the idea of monochromatic unidirectional radiation quanta produced by losses of energy by moving electrons. The electromagnetic theory, however, has been vastly extended in its usefulness.

There seems to be a need for search for modes of interpreting phenomena that are not bound *a priori* to any postulates that seem irreconcilable to what is too often referred to disparagingly as "classical theories."

Nazis may couple men and ideas for the purpose of

disparaging both. We should avoid any such confusion, either to disparage or to exalt a theory.

WM. MAYO VENABLE

PITTSBURGH, PA.

A SCIENTIST AT PEACE AND AT WAR FOUR HUNDRED YEARS AGO

THE manner in which one great scientist of the past, Nicolò Tartaglia of Brescia (*c.* 1500–1577), conducted his conscience in the face of the differing requirements of peace and war, may not be without some interest to scientists of the present day who find themselves in a similar situation.

In the "Epistola" to his "Della Nuova Scienza," written at Venice 20 December 1537 (O.S.), and addressed to his Excellency the Duke of Urbino, Tartaglia writes:

> When I was living in the town of Verona, Illustrious Duke, one of my intimates, my cordial friend the master of ordnance at the old castle, (a man of experience and great skill in his art, and endowed with an abundance of good qualities), asked me one day my opinion how to aim a piece of artillery to give it the greatest range. Although I had no practical knowledge whatever of artillery, for in truth, Excellent Duke, I have never in my life shot a single round with firearms, arquebus, bombard or musket, nevertheless, being desirous of serving my friend, I promised shortly to give him a definite answer to his question.[1]

Tartaglia then proceeds to give an account of his attack upon the problem set him by his friend, and then goes on to remark:

> As the result of this I had the intention of writing a treatise on the art of artillery, and to bring it to a degree of perfection capable of directing fire in all circumstances, assisted only by a few particular experiments: for as Aristotle says in the seventh book of the "Physica," Section 20, "particular experiments are the basis of universal science."

But, since then, one day meditating to myself, it had seemed to me that it was a thing blameworthy, shameful and barbarous, worthy of severe punishment before God and man, to wish to bring to perfection an art damageable to one's neighbour and destructive to the human race, and especially Christian men in the wars that they wage on one another. Consequently, not only did I altogether neglect the study of this matter and turned to others, but I even tore up and burnt everything which I had calculated and written on the subject, ashamed and full of remorse for the time I had spent on it, and well decided never to communicate in writing that which against my will had remained in my memory, either to please a friend or in teaching of these matters which are a grave sin and shipwreck to the soul.[2]

In view, however, of the preparations of the Turks to invade Italy, who, as Professor J. D. Bernal has pointed out,[3] were instigated by his Most Christian Majesty the King of France,[4] Tartaglia suffered a change of mind. He writes:

> To-day, however, in the sight of the ferocious wolf preparing to set on our flock, and of our pastors united for the common defence, it does not seem to me any longer proper to hold these things hid, and I have resolved to publish them partly in writing, and partly by word of mouth, for the benefit of Christians so that all should be in a better state either to attack the common enemy or to defend themselves against him. I regret very much at the moment having given up this work, for I am certain that had I persevered I would have found things of the greatest value, as I hope yet to find. . . . I hope that your Lordships will not disdain to receive this work of mine so as better to instruct the artillerymen of your most illustrious government in the theory of their art, and to render them more apt in its practice.[5]

M. F. ASHLEY MONTAGU

DEPARTMENT OF ANATOMY,
HAHNEMANN MEDICAL COLLEGE AND
HOSPITAL, PHILADELPHIA, PA.

SCIENTIFIC BOOKS

THE EARTH

Biography of the Earth. By GEORGE GAMOW. 242 pages; 35 plates; 58 figures. New York: Viking Press. 1941. $3.00.

THE barriers between the sciences are now quite generally down, and no geologist will think that even a professor of theoretical physics is poaching on forbidden territory when he writes such a book as this. On the contrary, geologists will thank Dr. Gamow for making the history of the earth so interesting to the layman by his lucid, fluent style, his enthusiasm for the subject, and his wise selection of items to be stressed. Certainly, the truly fascinating story of the origin, infancy and adolescence of an earth, still far from decrepit old age, has seldom been told with such verve and ingenuity of phrase, combined with essen-

[1] "Della Nuova Scienza," in "Questi et Invenzioni Diverse de Nicolo Tartaglia, Di nouo restampati con vna Gionta al sesto libro, nella quale si mostra duoi modi & continentia di tutta l'opera nel seguente foglio si trouara notata." [Venezia, 1550], (p. 1). I have not been able to see an earlier edition of this work, and so translate from the only edition available to me.

[2] *Ibid.*, p. 6.

[3] J. D. Bernal, "The Social Function of Science," p. 169. New York: The Macmillan Co., 1939. The second and third parts of the translations here given from Tartaglia are from the version in Bernal's excellent work. The passages are incorrectly attributed by him, on the basis apparently of a French translation, to a section entitled "L'Art de jecter les bombes."

[4] The modern parallel is, of course, Hitler playing Mephistopheles to Japan's Faust.

[5] Tartaglia, *loc. cit.*, p. 6.