

Still more on first computer

There have recently appeared a number of letters in *PHYSICS TODAY* (December, page 86) concerning the origins of the electronic computer. It is valuable to have the history of such a momentous invention illuminated in this way, but it is remarkable that the physicist who invented the electronic digital computer, J. V. Atanasoff, has not been mentioned in this correspondence.

Atanasoff was a graduate student of J. H. Van Vleck and calculated the electronic polarizability of helium using a hand calculator. Inspired by this experience, in the period 1935-42, while a physics professor at Iowa State College (now University), he invented and demonstrated the great majority of the fundamental principles that have since been used in successive generations of electronic computers. These included:

- ▶ The use of electronics for control, logic and arithmetic operations
- ▶ A method of serial digital, rather than analog, computation, based on a binary system
- ▶ A regenerative binary memory.

With graduate student Clifford Berry (now deceased) he constructed a small-scale prototype that successfully demonstrated the practicability of these principles in 1939. Between 1939 and 1942, they constructed a large-scale prototype with the special purpose of solving up to 29 simultaneous linear equations. Atanasoff's principles of electronic digital computation were further proved with this computer, which was brought to the point of being able to solve small sets of simultaneous equations before both Atanasoff and Berry were forced to abandon work on it to take part in the war effort. However, Atanasoff had communicated the principles and details of his computer—personally and by letter—to John W. Mauchly, and also suggested how it might be modified to perform numerical integration and solve differential equations. These principles were later incorporated by Mauchly and his colleagues into the ENIAC, the first general-purpose electronic digital computer.

This fascinating story has been

chronicled by Arthur W. Burks (who was himself involved in the development of the ENIAC and subsequent computers) and Alice R. Burks.¹ They conclude unequivocally: "Thus John Vincent Atanasoff was the inventor of the first electronic computer."

The question of priority in the invention of the electronic digital computer was the subject of a patent dispute between Honeywell and Sperry Rand in the early 1970s. This was settled through a lengthy court case and, after hearing all the available evidence, Judge Earl Larson² concluded that "Between 1937 and 1942, Atanasoff, then a professor of physics and mathematics at Iowa State College, Ames, Iowa, developed and built an automatic electronic digital computer for solving large systems of simultaneous linear algebraic equations." And further: "Eckert and Mauchly did not themselves invent the automatic electronic digital computer, but instead derived that subject matter from one Dr. John Vincent Atanasoff."

For physicists it is both gratifying and thought-provoking that Atanasoff remarked, in reference to his extremely successful career as an innovator, which includes surely one of the most important inventions ever made, that "I couldn't have had a better training. Theoretical physics is a uniquely effective discipline."

References

1. *Annals of the History of Computing* 3, 310 (1981).
2. *U.S. Patent Quarterly* 180, 673 (1974).

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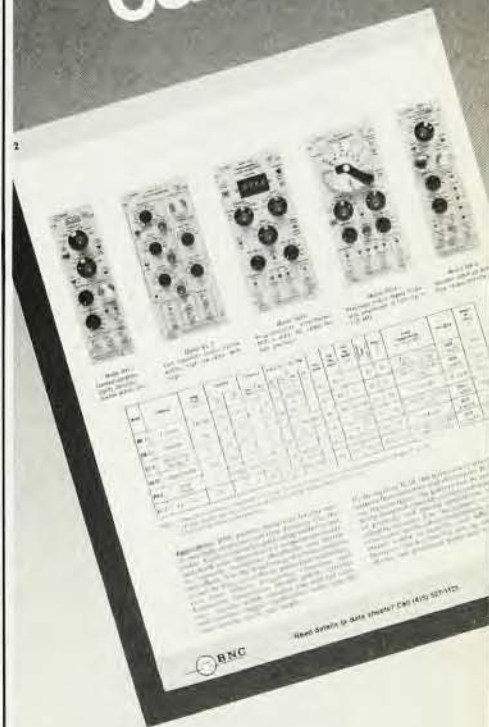
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Digesting the Dessertron

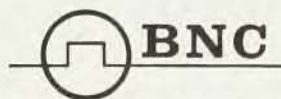
Let it be known that not all Texas A&M physicists suffer "Dessertron" fever. We much agree with the satirical jibes of Gary Taubes in his guest comment (December, page 9). "Bigger is better" may be how some Texans wish to have

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